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USATECOM PROJECT NO 1-VC-087-551-002

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PRODUCT IMPROVEMENT TEST

OF

SHERIDAN WEAPON SYSTEM, M551

(ARCTIC/UNIVERSAL TRACK AND WIDE SPROCKET WHEEL)

FINAL REPORT

BY

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AND

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SCIENTIFIC AND ENGINEERING

1 DECEMBER 1970

US ARMY  
ARMOR & ENGINEER BOARD  
FORT KNOX, KENTUCKY

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DEPARTMENT OF THE ARMY MAJ Duncan/scj/464-4828  
UNITED STATES ARMY ARMOR AND ENGINEER BOARD  
Fort Knox, Kentucky 40121

STEBB-TD-A


30 April 1971

SUBJECT: Product Improvement Test Report of Sheridan Weapon System,  
M551 (Arctic/Universal Track and Wide Sprocket Wheel), USATECOM  
Project No I-VC-087-551-002

SEE DISTRIBUTION AT INCLOSURE 14, SUBJECT REPORT

1. Reference is made to letter, STEBB-TD-A, US Army Armor and Engineer Board, 23 February 1971, subject as above.
2. Attached is HQ US Army Test and Evaluation Command approval letter, dated 13 April 1971, for subject report which was forwarded to you by above referenced letter. A copy of this letter should be attached inside the front cover of each copy of the report in your possession.

FOR THE PRESIDENT:

  
NOEL A. SCHAUB  
CPT, AGC  
Adjutant

1 Incl  
as

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AM/7256

DEPARTMENT OF THE ARMY LT McLean/726-3300/4-4449  
UNITED STATES ARMY ARMOR AND ENGINEER BOARD  
Fort Knox, Kentucky 40121

1 DEC 1970

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SUBJECT: Final Report of Product Improvement Test of Sheridan  
Weapon System, M551 (Arctic/Universal Track and Wide  
Sprocket Wheel), USATECOM Project No 1-VC-087-551-002

Commanding General  
US Army Test and Evaluation Command  
ATTN: AMSTE-BB-S  
Aberdeen Proving Ground, Maryland 21005

1. REFERENCES

a. Ltr, AMSTE-BB-S, HQ USATECOM, 4 Nov 69, subject: Test Directive, Product Improvement Test of Sheridan Weapon System, M551, Arctic/Universal Track and Wide Sprocket Wheel, USATECOM Project Nos. 1-VC-087-551-001/-002, w 2 incl.

b. Ltr, AMSTE-BB-S, HQ USATECOM, 31 Dec 69, subject: Test Directive, Product Improvement Test of Sheridan Weapon System, M551, Arctic/Universal Track and Wide Sprocket Wheel, USATECOM Project Nos. 1-VC-087-551-001/-002, w 1 incl.

c. Ltr, AMSTE-BB-S, HQ USATECOM, 26 Mar 70, subject: Test Directive, Product Improvement Test of Sheridan Weapon System, M551, Arctic/Universal Track and Wide Sprocket Wheel, USATECOM Project Nos. 1-VC-087-551-001/-002, w 1 incl.

d. USAARENBD Plan of Product Improvement Test of Sheridan Weapon System, M551 (Arctic/Universal Track and Wide Sprocket Wheel), USATECOM Project No 1-VC-087-551-002, 16 Mar 70.

e. USAARENBD Final Report of Confirmatory Test of Sheridan Weapon System, M551, USATECOM Project No. 1-4-2528-31, 16 September 1968.

## 2. BACKGROUND

a. The present production track for the M551 Sheridan vehicle does not provide adequate traction on ice and snow. Arctic track was developed to overcome this problem. It has been suggested that the presently released arctic production track may be satisfactory for worldwide application. If this could be confirmed, it would eliminate the need for two separate tracks (production and arctic).

b. Sprocket wheel life on the M551 vehicle during troop and combat use has shown a significant decrease from that achieved during initial testing. Investigations have revealed that improvement in sprocket life can be expected by use of a wider sprocket. As a result, a wider sprocket was designed and was submitted for testing to determine if the new design offers a significant improvement over the current production type.

c. One set of arctic/universal track and four wide sprocket wheels were tested at the USAARENBD under the authority contained in references 1a, 1b, and 1c.

## 3. DESCRIPTION OF MATERIEL

a. The arctic track is identified as SK-9041-15, Spec No 38878, and consists of single pin track blocks with a chevron design grouser and removable rubber pad. The dimensions of the track block are identical to those of the standard production track. The track pin is identical to the standard track pin. Photographs are at inclosures 1 and 2.

b. The wide sprocket wheel tested is identical in design to the standard production sprocket except that it is 5/8 inch wider (2-1/8 inches overall) than the standard sprocket. Photographs are at inclosures 3 and 4.

## 4. TEST OBJECTIVES

a. To determine the durability of the arctic track and the wide sprocket wheel.

b. To determine the mobility of the M551 vehicle when equipped with the arctic track with and without track pads.

c. To determine whether the arctic track and/or the wide sprocket wheel result in any degradation to the basic vehicle.

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d. To accumulate parts failure data on components of the M551 facility vehicle other than that related to the wide sprocket wheels and track.

5. SUMMARY OF RESULTS. Testing of the Arctic/Universal Track and Wide Sprocket Wheel was conducted by the Armor Test Branch, US Army Armor and Engineer Board, during the period 7 August 1970 to 2 November 1970, at Fort Knox, Kentucky, utilizing the plan of test, reference 1d.

a. Preoperational Inspection and Physical Characteristics

(1) The test items received a preoperational inspection upon receipt. The items were complete and suitable for testing.

(2) One arctic/universal track block, with removable rubber pads and track pin, weighed 20 pounds. A comparison standard track block, with track pin, weighed 18 pounds, 5 ounces. The two individual removable track pads of the test item weighed 1.5 pounds each. The height, width, and length of the test item was identical to that of the standard item. Photographs of the test item and a comparison standard item are contained in inclosures 1 and 2.

(3) The test wide sprocket wheel weighed 41 pounds and was 2-1/8 inches wide. A comparison standard item weighed 33.5 pounds and was 1-1/2 inches wide. The test wide sprockets had indented, circular markings on 3 of the 11 sprocket teeth to indicate the wear limits of the sprocket teeth. Photographs of the test item and a comparison standard item are contained in inclosures 3 and 4.

b. Assembly, Installation, and Break-In Operations

(1) The test wide sprockets were installed on two M551 vehicles. One vehicle was equipped with the standard track and one was equipped with the test arctic/universal track. Installation was accomplished at organizational maintenance level using organizational maintenance tools, and following procedures contained on page 9-80, TM 9-2350-230-12. Three mechanics required 0.5 clock-hours, 1.5 man-hours for installation of each set of sprockets. Organizational maintenance level tools and equipment and instructions contained in the technical manual were adequate. A list of the organizational tools used is contained in part A, incl 10.

(2) The test arctic/universal track was assembled and installed on an M551 vehicle by the vehicle crew (four men) using the basic issue list items (BILI) and following the procedures contained on page 5-14, Change 3 of TM 9-2350-230-12. The crew required 2.5 clock-hours, 10.0 man-hours to install the test track. This does not differ appreciably from normal installation time for standard track. No special tools were required for the installation and the basic issue list items were considered adequate. The BILI tools used are listed in part B, incl 10. It was noted, however, that the standard track connecting fixture (FSN 4910-906-1053) did not fit into the sprocket opening of the test track as well as it normally did on the standard track due to the modified shape of the opening on the test item. This made use of the fixture somewhat more difficult than normal.

(3) The M551 vehicles with the test items installed were operated for 50 highway miles at speeds of 10, 15, and 20 mph as prescribed in the test plan for break in of the items. After break-in operation, two organizational maintenance level mechanics required 0.8 clock-hours, 1.6 man-hours to check torque on all track pins and sprocket bolts. No corrective maintenance was required.

c. Mobility. The mobility subtest, which was scheduled for the approximate midpoint of the test, was not conducted due to premature failure of the arctic/universal track.

d. Fuel Consumption

(1) Fuel consumption data for the vehicle equipped with the arctic track and wide sprocket wheel and a comparison vehicle equipped with the standard track and test wide sprocket wheel were recorded after 4 hours of test course operation. Each vehicle was operated for 18 miles highway, 22 miles secondary, and 16 miles cross country. All surfaces were dry. The vehicle with the test track used 25.3 gallons of fuel and averaged 2.21 miles/gallon. The vehicle with the standard track used 34.5 gallons of fuel for an average of 1.62 miles/gallon. An accurate comparison is not possible, however, because the vehicle equipped with the standard track was SEA configured and therefore considerably heavier than the vehicle equipped with the arctic track. Further fuel consumption data could not be obtained for test course operation due to the premature failure of the test track. Overall fuel consumption data for both vehicles during testing are tabulated below:

	<u>Miles of Operation</u>	<u>Gallons of Fuel Consumed</u>	<u>Average Miles/Gal</u>
Standard Track Vehicle	1,964	1,465.6	1.34
Arctic Track Vehicle	1,948	1,160	1.68



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(2) The historical fuel consumption rate of the vehicle equipped with the arctic track was computed for a 2-month period prior to installation of the test item. During this period the vehicle averaged 1.70 miles/gallon. Average fuel consumption from confirmatory testing of the M551 vehicle (reference 1e) varied from 1.23 miles/gallon to 2.33 miles/gallon.

(3) Examination of these historical data indicate that there is no significant increase in the fuel consumption rate of the M551 vehicle as a result of the test track installation.

e. Maintainability

(1) During all testing, crew maintenance of the arctic/universal track and wide sprocket wheel was performed as necessary. Crew maintenance operations included: daily before, during, and after operation inspection of the track and sprockets; installation and removal of individual track blocks and removable track pads; and adjustment of track tension.

(2) During the test period, 9.8 clock-hours, 39.2 man-hours were required for daily crew maintenance and 35.5 clock-hours, 142.0 man-hours were required for unscheduled crew maintenance of the arctic/universal track and wide sprocket wheel. The standard track and wide sprocket wheel on the comparison M551 vehicle required 6.0 clock-hours, 24.0 man-hours for daily crew maintenance and 21.5 clock-hours, 86.0 man-hours for unscheduled crew maintenance during a comparable period of test operation. The separation of numerous inner track pads, track bushing failures, broken track pins, and other failures of the test track as described in para 5f(4) account for the increase in maintenance time required for the arctic/universal track.

(3) The timed track pad removal exercises which were part of the mobility subtest were not conducted. However, timed exercises were conducted to determine the average time required to remove and install a single track pad. Track pad removal was performed by one crew member and required an average of 56 seconds. Pad installation averaged slightly longer, approximately 1 minute. Additional time was also required during installation for torquing of the individual pads.

(4) The standard M551 vehicle BILI were adequate for performance of crew maintenance operations.

(5) There were no difficulties encountered in crew maintenance of the arctic/universal track. It was noted, however, that the standard sprocket wear gauge (FSN 5210-906-3706) could not be used to measure the wear on the test wide sprockets due to their increased width. The procedure outlined on page 9-80, TM 9-2350-230-12 is not required to measure wear of the test wide sprockets. The wide sprockets had indented, circular markings on 3 of the 11 sprocket teeth to indicate the wear limits of the sprocket teeth. These markings were used to determine remaining sprocket wear and the need for sprocket reversal.

f. Reliability

(1) The M551 vehicle with the arctic/universal track and wide sprocket wheel was operated for a total of 1,948 miles, 138.5 hours as tabulated below:

	<u>Cross Country</u>	<u>Secondary Road</u>	<u>Highway</u>
Miles	713	589	646
Hours	75	37.5	26

Testing was terminated at that point in test operation due to the test item component failures outlined in para 5f(4). The comparison M551 vehicle with the standard track and test wide sprocket wheel terminated testing at 1,964 miles of test operation (677 miles cross country, 749 miles secondary road, and 538 miles highway) in order that a comparison could be made between the test and standard tracks.

(2) The plan of test specified that one of the test sprockets not be reversed for the duration of the 4,000-mile test. However, the sprocket which was selected to fulfill this requirement was worn well past the wear marks after 1,380 miles of test operation and was reversed to prevent breakage of the sprocket teeth. The remaining 3 sprockets were reversed at approximately every 500 miles of operation. (See part A, incl 11, for total miles of operation for each sprocket.) Wear of all sprockets appeared to be equal at each reversal and at the end of test. (See photographs, inclosures 8 and 9.)

(a) As previously noted in para 5e(5), the standard wear gauge was not suitable nor required for measurement of the test sprocket wear. Sprocket wear was monitored visually during the test as a preventive maintenance measure.

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(b) There were no failures of the wide sprockets noted during the test.

(c) Data obtained from confirmatory testing (reference 1e) of the M551 vehicle shows that the average life of standard sprockets during testing was 1,125 miles. The two sets of test wide sprockets were used for 1,948 and 1,964 miles of test operation. Inspection of the test sprockets revealed that there was sufficient wear left to continue their operation beyond the test termination. (See photographs, inclosures 8 and 9.)

(3) Wear of the removable track pads was measured after every 250 miles of test operation. Pad wear was measured in inches from the top of the rubber pad to the outside bottom edge of the track pad "cup" as shown in the photograph, inclosure 5. Average track pad thickness measurements for each 250 miles of testing are tabulated in part B, inclosure 11. Track pad wear, however, was measured to the highest remaining part of the rubber pad and in many cases was not indicative of the actual wear that occurred. The photographs in inclosures 6 and 7 show examples of extreme track pad wear as evident at the end of testing. After approximately 1,000 miles of testing, it was noted that all rubber track pads were cracking in the same place as a result of contact with a portion of the metal grouser. Close examination of the pads showed that they had shifted approximately 1/8 inch during operation, and were making constant contact with the short, outer section of the metal grouser. (See photograph, inclosure 7.) The severity of the cracking did not increase significantly prior to the termination of the test.

(4) Numerous failures of the arctic/universal track components were encountered during the test and are described below:

(a) After 101 miles of vehicle operation (27 miles cross country, 15 miles secondary road, and 59 miles highway) five rubber pads on the road wheel surface of the track separated from their track blocks. (See upper photograph, inclosure 7.) The separation was apparently caused by an improper bonding of the rubber pad to the metal track block. A sixth inner pad separated after 214 miles of operation (27 miles cross country, 112 miles secondary road, and 75 miles highway). (See para 1.1, incl 13.) The three track blocks from which the inner pads had separated were replaced.

(b) During an at-halt inspection following 1,623 miles of operation (589 miles cross country, 537 miles secondary road, and 497 miles highway), it was noted that the bushings of two adjoining track blocks showed excessive wear. During replacement of the track blocks, it was discovered that the track pin was broken. All five bushings were badly worn. (See para 1.2, incl 13.)

(c) After 1,948 miles of operation (713 miles cross country, 589 miles secondary road, and 646 miles highway), a second track pin was found broken. All five bushings of the two adjoining track blocks were badly worn. (See para 1.3, incl 13.) Examination of the remainder of the track blocks in the track set revealed that numerous bushings were excessively worn. Accordingly, the track was inspected by USAARENBD maintenance personnel and a Fort Knox Field Maintenance Inspector. As a result of the inspection, 97 track blocks (38 blocks from the right track and 59 blocks from the left track) were condemned as being unsafe to operate. (See para 1.4, incl 13.) Excessive wear of the track bushings was the criteria for the condemnation of all track blocks. No replacement arctic track blocks were available and the test was terminated at the direction of USATECOM.

(5) An inspection of the comparison standard track was made by USAARENBD maintenance personnel and a Fort Knox Field Maintenance Inspector after 1,964 miles of test operation. As a result of the inspection, 55 track blocks (31 blocks from the right track and 24 blocks from the left track) were condemned as being unsafe to operate. These blocks were also condemned for excessive bushing wear. The standard track showed no signs of inner track pad separation or track pin failure during the test.

(6) A record of all vehicle component failures for the vehicle equipped with the arctic/universal track and wide sprocket wheel is contained in inclosure 12. Only one failure of host vehicle components was recurring in nature; that is, the breaking of numerous suspension system bolts (11 front idler bolts and seven sprocket carrier wheel bolts). Four suspension system bolts were found broken on the vehicle equipped with the standard track (one torsion bar anchor bolt and three sprocket carrier wheel bolts). New suspension system bolts had been installed in all sprockets, carrier wheels and idler wheels at the start of testing. The cause of these failures is unknown, but, in the opinion of this board, the increased weight of the arctic/universal track was a contributing factor.

(7) During testing, 13.0 clock-hours, 52.0 man-hours were required for the crew to repair failures of the test track listed in para 5f(4), above. The following test item repair parts were used

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during testing: 11 track blocks were replaced due to separation of the rubber pad on the road wheel surface of the track; bushing wear, or damage to the center guides; seven replacement rubber track pads were used to replace missing or badly deteriorated pads.

6. CONCLUSIONS. The US Army Armor and Engineer Board concludes that:

a. The test wide sprocket wheel is significantly more durable and has a greater service life than does the standard sprocket.

b. The arctic/universal track has durability of approximately 2,000 miles in the environment in which it was tested.

c. The mobility of the arctic/universal track could not be determined due to early test termination.

d. The wide sprocket wheel has no apparent degrading effects on performance or durability of the basic vehicle.

e. The installation of the arctic/universal track displayed degrading effects on the durability of suspension system components.

14 Incl

1-9. Photographs


10. Tool Requirements

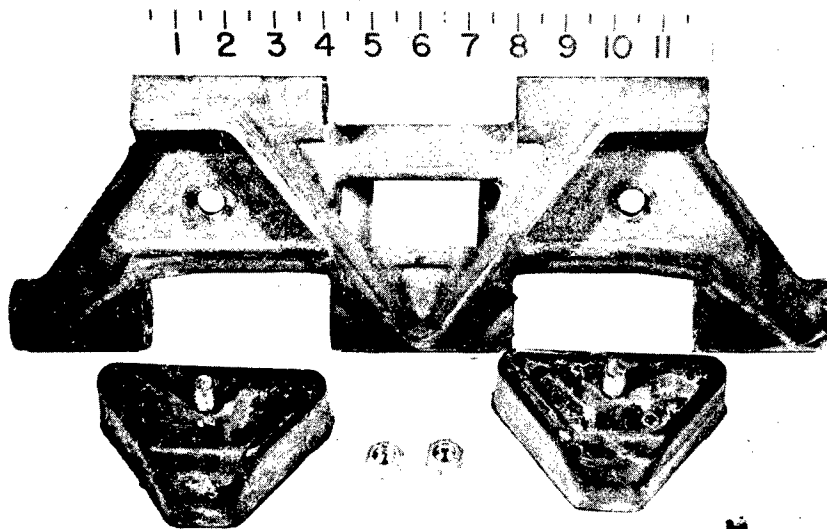
11. Mileage of Test Operations

12. Component Failure Data

13. Deficiencies

14. Distribution List

  
ALBERT H. HISLOP  
Colonel, Armor  
President



US ARMY ARMOR AND ENGINEER USATECOM PROJ NO 1-VC-087-551-002  
BOARD FORT KNOX, KY PHOTO NO 70-353

ARCTIC/UNIVERSAL TRACK AND WIDE SPROCKET WHEEL  
ARCTIC/UNIVERSAL TRACK BLOCK WITH REMOVABLE PADS

INCL 1



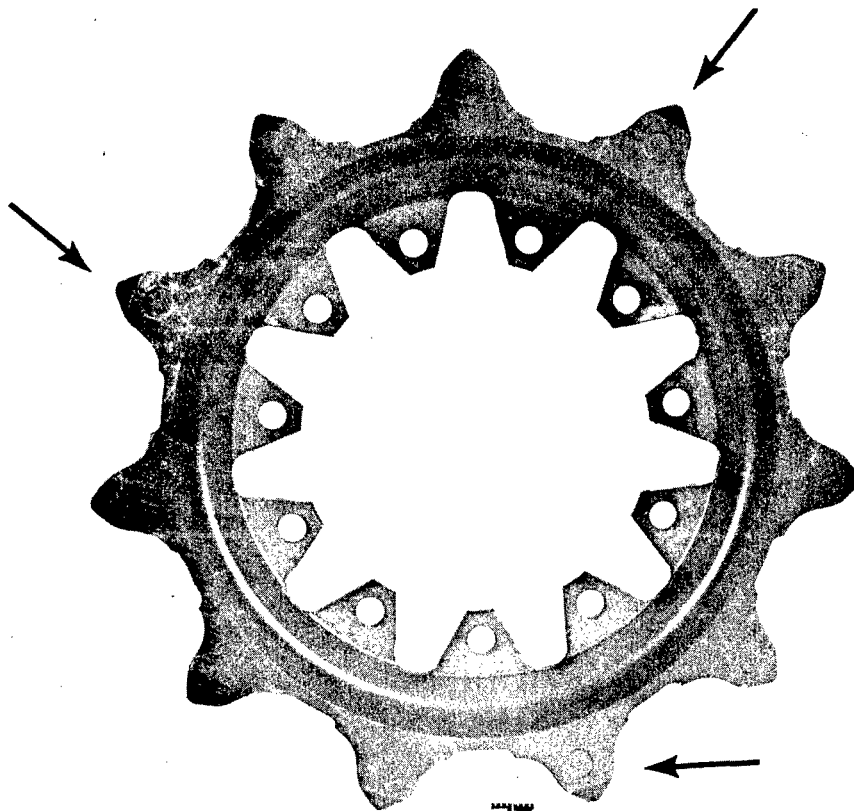
US ARMY ARMOR AND ENGINEER USATECOM PROJ NO 1-VC-087-551-002  
BOARD FORT KNOX, KY PHOTO NO 70-352A

ARCTIC/UNIVERSAL TRACK AND WIDE SPROCKET WHEEL

LEFT: ARCTIC/UNIVERSAL TRACK BLOCK

RIGHT: STANDARD TRACK BLOCK

INCL 2



US ARMY ARMOR AND ENGINEER USATECOM PROJ NO 1-VC-087-551-002  
BOARD FORT KNOX, KY PHOTO NO 70-281A

ARCTIC/UNIVERSAL TRACK AND WIDE SPROCKET WHEEL

WIDE SPROCKET WHEEL

(ARROWS DENOTE WEAR LIMIT MARK)

INCL 3



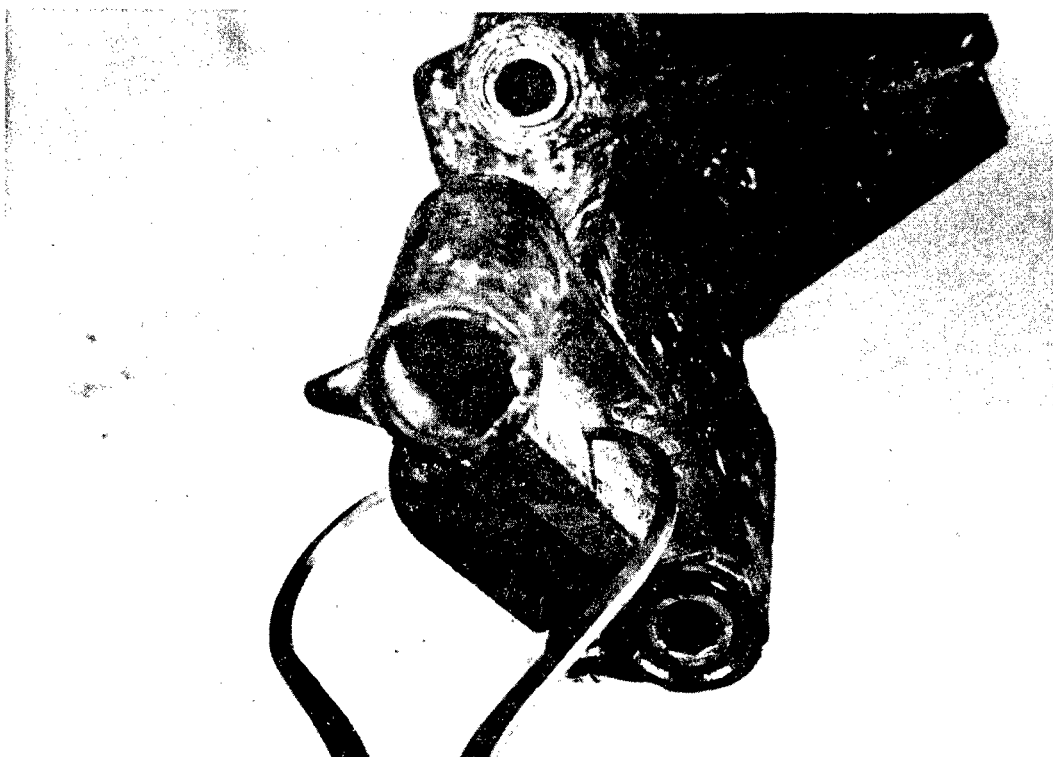


US ARMY ARMOR AND ENGINEER BOARD FORT KNOX, KY	USATECOM PROJ NO1-VC-087-551-002 PHOTO NO 70-299A
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ARCTIC/UNIVERSAL TRACK AND WIDE SPROCKET WHEEL

LEFT: STANDARD SPROCKET WHEEL

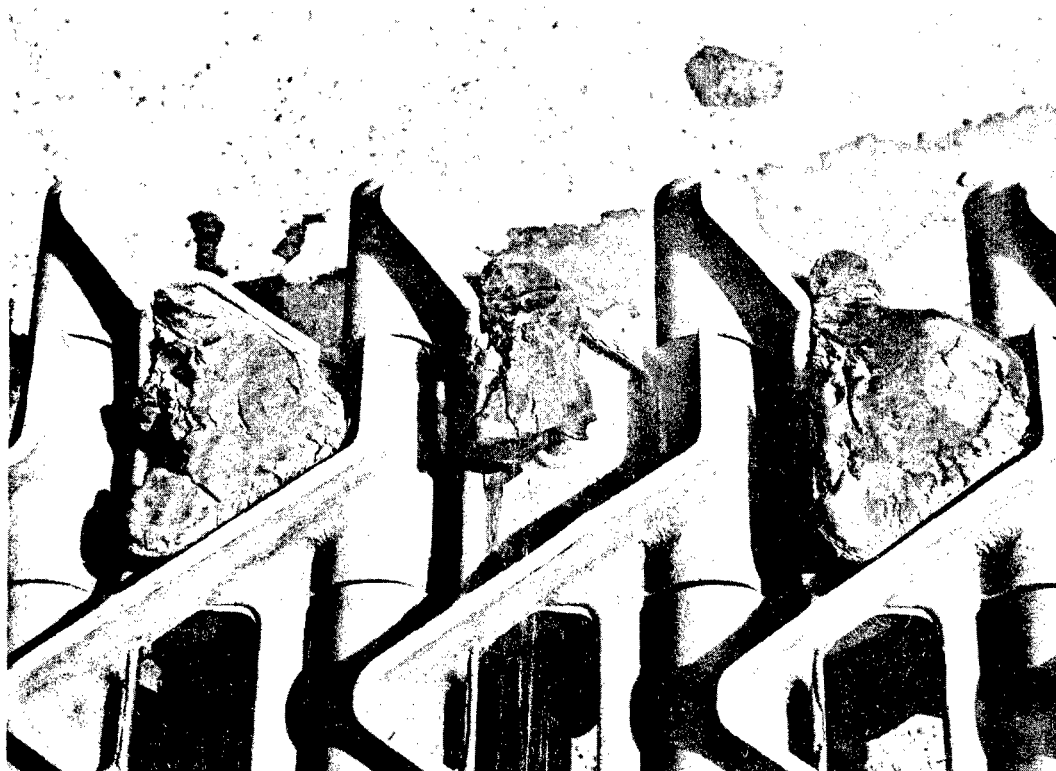
RIGHT: WIDE SPROCKET WHEEL



US ARMY ARMOR AND ENGINEER BOARD	USATECOM PROJ NO 1-VC-087-551-002 FORT KNOX, KY PHOTO NO 70-565
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ARCTIC/UNIVERSAL TRACK AND WIDE SPROCKET WHEEL

POINT OF MEASUREMENT OF TRACK PAD WEAR

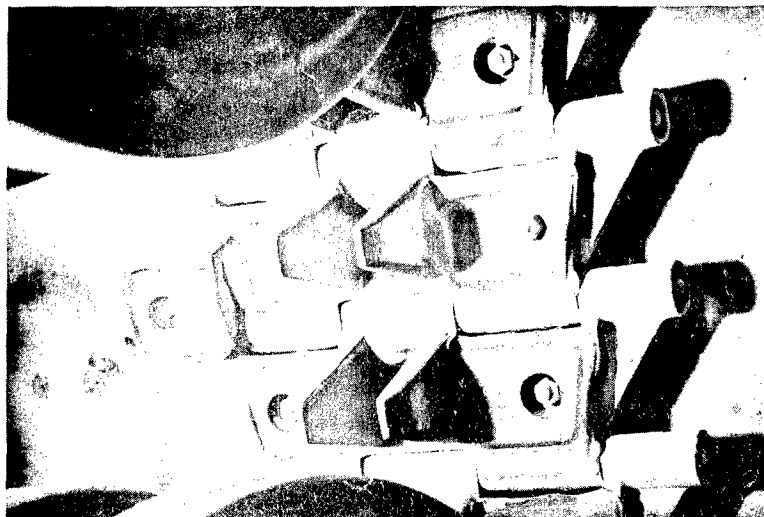
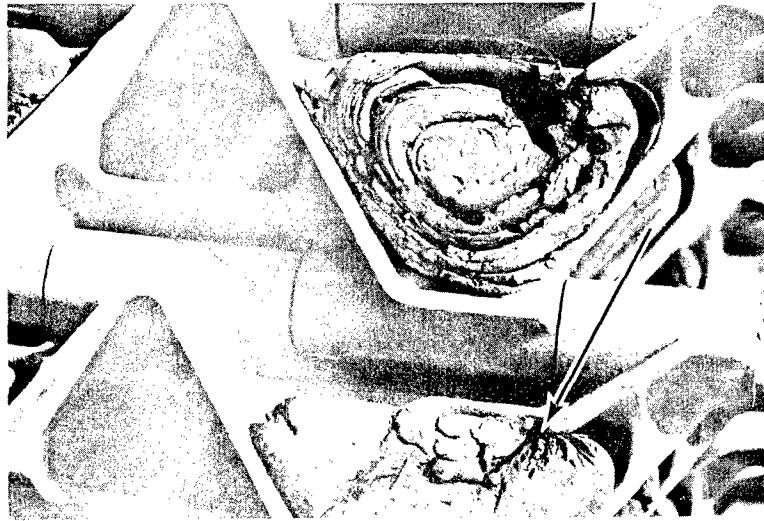


US ARMY ARMOR AND ENGINEER  
BOARD FORT KNOX, KY

USATECOM PROJ NO 1-VC-087-551-002  
PHOTO NO 70-516A

ARCTIC/UNIVERSAL TRACK AND WIDE SPROCKET WHEEL

ARCTIC TRACK PAD WEAR AT TERMINATION OF TESTING

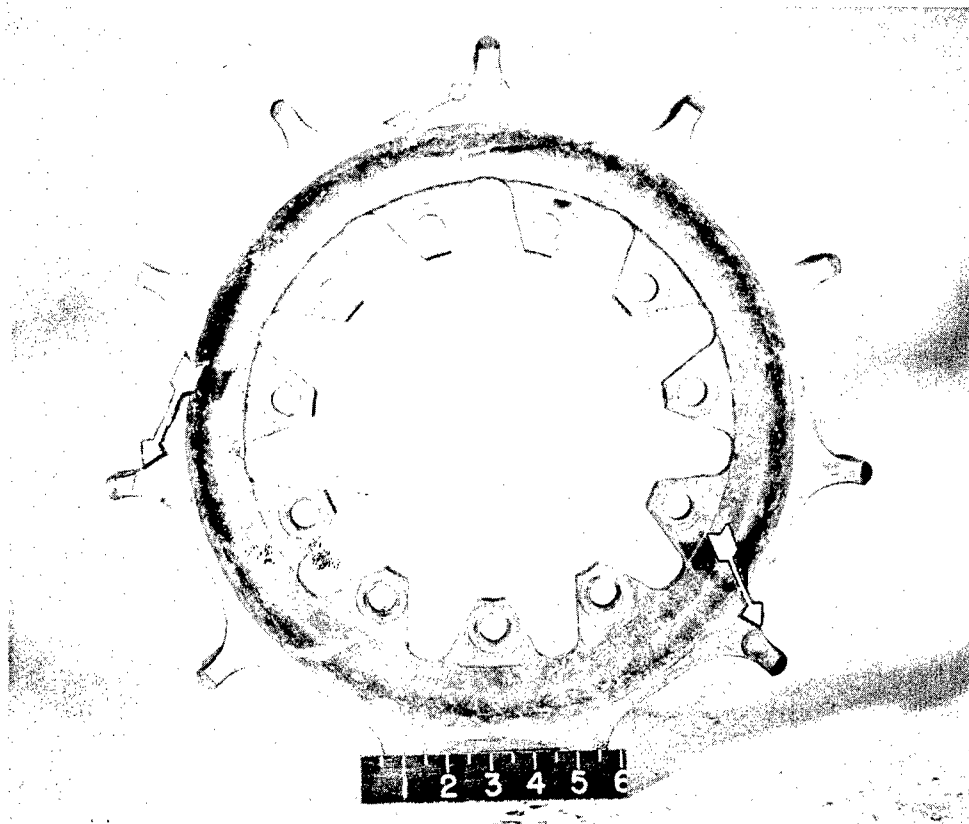


US ARMY ARMOR AND ENGINEER USATECOM PROJ NO 1-VC-087-551-002  
BOARD FORT KNOX, KY PHOTO NO 70-516E

ARCTIC/UNIVERSAL TRACK AND WIDE SPROCKET WHEEL

UPPER: ARCTIC TRACK PAD WEAR AT  
TERMINATION OF TESTING  
(ARROW DENOTES CRACKING  
FROM CONTACT WITH GROUSER)

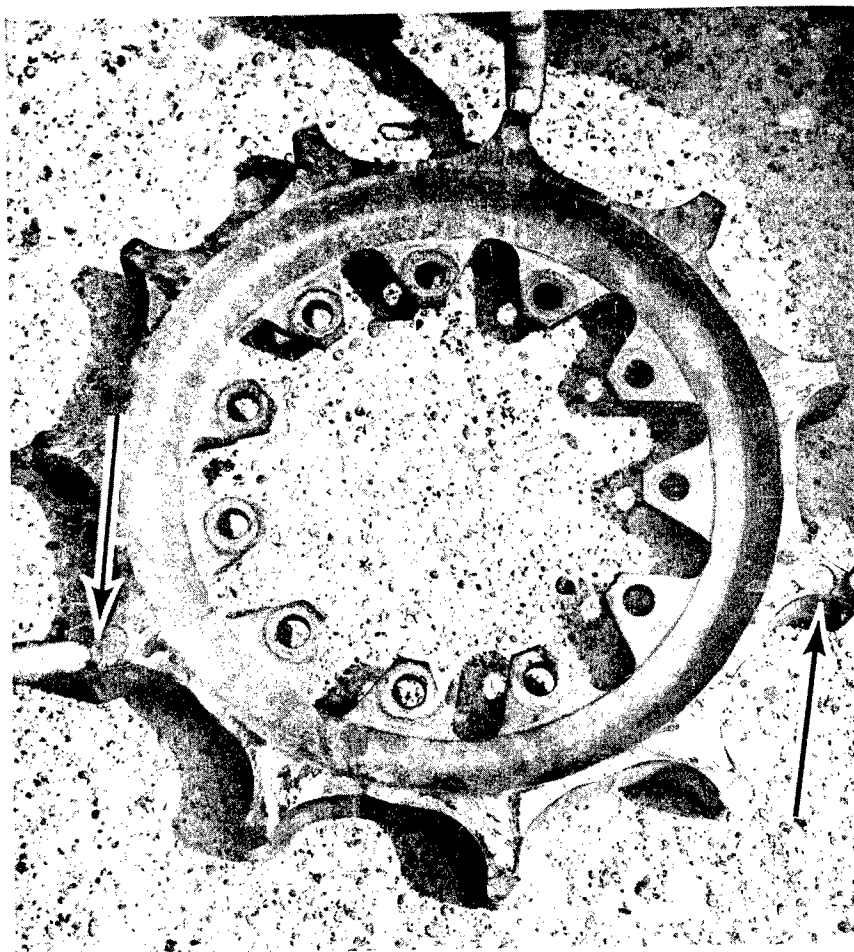
LOWER: SEPARATION OF RUBBER PAD  
FROM ROAD WHEEL SURFACE  
OF THE TEST TRACK



US ARMY ARMOR AND ENGINEER USATECOM PROJ NO 1-VC-087-551-002  
BOARD FORT KNOX, KY PHOTO NO 70-540A

ARCTIC/UNIVERSAL TRACK AND WIDE SPROCKET WHEEL  
WIDE SPROCKET WEAR AT TERMINATION OF TESTING -  
STANDARD TRACK

INCL 8



US ARMY ARMOR AND ENGINEER BOARD FORT KNOX, KY

USATECOM PROJ NO 1-VC-087-551-002  
PHOTO NO 70-516I

ARCTIC/UNIVERSAL TRACK AND WIDE SPROCKET WHEEL

WIDE SPROCKET WEAR AT TERMINATION OF TESTING -  
ARCTIC/UNIVERSAL TRACK

(ARROW DENOTES EXCESSIVE WEAR AFTER 1,380 MILES OF  
OPERATION WITHOUT SPROCKET REVERSAL)

PART A

Tools Required for Organizational Maintenance  
of the Wide Sprocket Wheel

<u>Tool</u>	<u>FSN</u>
Socket, Socket Wrench 5/8" open, 1/2 in sq dr	5120-189-7946
Handle, Socket Wrench 9 inch, 1/2 in sq dr	5120-230-6385
Wrench, Torque 1/2 in drive 175 ft lb capacity	5120-277-1461

PART B

Tools Required for Crew Installation  
of the Arctic/Universal Track

<u>Tool</u>	<u>FSN</u>
Crowbar, Pinch Point, Nom Dia. 1", 47" - 49" long	5120-240-6040
Hammer, Mach. Ball Peen, 2 lb	5120-224-4047
Punch Assy, Drift Pin	5120-678-2745
Fixture, Track Connecting	4910-906-1053
Wrench, Adj., Single End 15/16" opening, 8" long	5120-240-5328
Universal Joint, Socket Wrench, hand, 1/2" sq dr	5120-269-7971
Socket, Socket Wrench, 1/2 in sq dr, 12 pt, 11/16"	5120-235-5870
Gun, Grease	4930-253-2478

PART A

Miles of Test Operation for Each Set of Test Wide Sprockets

Arctic Track Installation

	<u>Side 1</u>	<u>Side 2</u>
Left Sprocket	1,055	895
Right Sprocket	1,380	570

Standard Track Installation

	<u>Side 1</u>	<u>Side 2</u>
Left Sprocket	1,031	933
Right Sprocket	1,031	933

PART B

Average Track Pad Thickness Measurements for  
Each 250 Miles of Test Operation

<u>Mileage</u>	<u>Pad Thickness (Inches)</u>
0	2
250	2
500	1-15/16
750	1-15/16
1,000	1-15/16
1,250	1-7/8
1,500	1-7/8
1,750	1-13/16
1,948	1-13/16



VEHICLE COMPONENT FAILURE DATA FOR THE M551  
VEHICLE WITH ARCTIC/UNIVERSAL TRACK  
AND WIDE SPROCKET WHEEL INSTALLED

1. A total of seven bolts (5306-841-1881) for track support wheels broke during operation.
2. A total of 11 bolts (96906-35764-666) for the suspension idler wheel broke during operation.
3. A total of three track support wheels (2520-916-2261) broke in the area of the mounting tongues.
4. The right final drive hub burned out during operation.
5. The right suspension idler seal (06979-802427) developed a leak during operation.

# DEFICIENCIES

<u>Deficiency</u>	<u>Suggested Corrective Action</u>	<u>Remarks</u>
1.1 Six inner track pads separated from three track blocks.	Improve quality control of bonding between track pads and track block.	See EPR No KD-2 (reclassified a deficiency by EPR No KD-2-S1), EPR No KD-3-(2-1), and para 5f(4)(a).
1.2 The bushings of two adjoining track blocks were worn excessively after 1,623 miles of operation. Examination revealed that the connecting track pin was broken.	None	See EPR No KD-7 (reclassified a deficiency by EPR KD-7-S1) and para 5f(4)(b).
1.3 A second track pin broke after 1,948 miles of operation. Related track bushings were excessively worn.	None	See EPR No KD-9-(7-1) and para 5f(4)(c).
1.4 A total of 97 track blocks (38 on the right track and 59 on the left track) was worn excessively. The tracks were condemned by USAARENBD maintenance personnel and a Fort Knox Field Maintenance Inspector as being unsafe to operate.	None	See EPR No KD-10 and para 5f(4)(c).

NOTE: Equipment failure reports KD-1, 4, 5, 6, and 8 were submitted "For Information Only" and are not shown in this inclosure.

# DISTRIBUTION LIST

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13. ABSTRACT			
<p>Test objectives were to determine: the durability of the arctic track and wide sprocket wheel, the mobility of the M551 vehicle when equipped with the arctic track with and without pads, whether the arctic track and/or the wide sprocket wheel result in any degradation to the basic vehicle, and to accumulate parts failure data on components of the M551 facility vehicle other than that related to the wide sprocket wheels and track. Testing was conducted at Fort Knox, Kentucky, from 7 August 1970 to 2 November 1970. Arctic track was assembled and installed by the crew in 28.0 man-hours. Two sets of wide sprocket wheels were installed by organizational mechanics in 1.5 man-hours each. All basic issue items and organizational tools were adequate for the installation. Mobility exercises were not conducted due to premature failure of the test track. The test items had no significant effect on the fuel consumption rate of the M551 vehicle. No failures of the test sprocket were experienced. There were four deficiencies of the test track reported. After 1,948 miles of test operation, the test track was inspected by USAARENBD personnel and a Fort Knox Field Maintenance Inspector. A total of 97 arctic track blocks was condemned as being unsafe to operate. After 1,964 miles of operation, a total of 55 standard track blocks was condemned. On the arctic track, a total of 18 suspension system bolts broke on several different occasions. Data obtained during confirmatory testing showed the service life of standard sprockets was approximately half of that displayed by test wide sprockets. It was concluded that the test wide sprocket wheel is significantly more durable and has a greater service life than does the standard sprocket. The arctic/universal track has durability of approximately 2,000 miles in the environment in</p>			

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13. ABSTRACT (cont)

which it was tested. The mobility of the arctic/universal track could not be determined due to early termination. The wide sprocket wheel has no apparent degrading effect on performance or durability of the basic vehicle, and installation of the arctic/universal track displayed degrading effects on the durability of suspension system components.